FAST PASSAGES AND BEST
ROUTES.

by William Allingham.

(Shipmasters' Society of
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Fast Passages and Best Routes.

BY

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STEAM has not yet driven the sailing-ship from off the seas, despite the pessimistic predictions which were rife when the Suez Canal was approaching completion. It has, however, in a great measure, determined the size of ships impelled by the unbought wind. Fifty years ago there were not more than 150 sailing-ships in existence in the British Merchant Navy exceeding 500 tons register. This seems scarcely credible, having regard to the huge craft, of three, four, and five masts, that have to be handled by seamen to-day. A well-known firm, Smith's "City" Line, with the best of records, in the past half century owned 52 sailing-ships averaging rather less than 1,000 tons register each. The most sought after sailing-ships have increased from 1,000 tons in 1860, to 1,500 in 1870, and 2,000 in 1880. Apparently 2,500 to 3,500 tons register will be the approved size of the paying sailing-ship in 1900. Steamships have also increased in size;

and evidently the defunct *Great Eastern* had merely the misfortune to be born too soon, for the latest triumphs of the naval architect and the marine engineer do not fall far short of that leviathan. No matter how large a vessel may be, whether under sail or steam, she has but one master. A sailing-ship of 3,000 tons register, carrying 5,000 tons of coal from Cardiff to California, does not have any more officers than the East Indiaman of our fathers of not one quarter the tonnage. There is consequently a greater need than ever for a proper appreciation of the soft spots in wind circulation in order to avoid more rope hauling than is absolutely necessary. A knowledge of where to find a fair wind and a favourable current is still a desirable thing to have on board ships of all sorts and conditions.

When third mate of a large clipper ship, under the United States flag, it was my misfortune to have a bitter six weeks' experience off Cape Horn. We had made a rapid run from New York, bound for San Francisco, Cal., and every omen seemed propitious for a splendid slant round that nasty corner. As not infrequently happens, the light easterly breeze died away, hauled out ahead, and increased to a strong gale. We had quickly reduced from skysails to lower topsails; skysail yards were sent on deck; and there we stuck to our text. The question was jestingly raised, perhaps to wile away the dark hours, and discussed to the best of our ability, whether a quicker passage might not be effected by keeping away for Bass's Strait so as to reach our port by utilising Maury's "brave west winds" of the roaring forties. So far there seemed no precedent, and the conclusion arrived at was adverse to an experimental cruise. Cape Cod had never produced a more skilful seaman and capable navigator than our commander who had rounded Cape Horn many times. He disliked being beaten, and we all backed up his views. Since then it has been strongly borne in upon me that much wear and tear of both the ship and her crew might have been avoided, and the passage absolutely shortened in point of time, had we turned tail immediately and ran eastward. In 1876 the Liverpool iron ship *Wasdale*, Captain O. Bley, clearly demonstrated that fortune favours the brave, occasionally at any rate. Her master is to be congratulated on

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having carefully weighed his probabilities and boldly brought them to a successful issue. Five years later the *MacMillan*, Captain C. Grey, R.N.R., deeply laden, went the same way. These passages, to which further reference is made in the body of the paper, have convinced me that safety and rapidity are enhanced by avoiding Cape Horn should the ship be weak, deep, or poorly found. For this reason I have dealt with that route more especially in detail.

To the illustrious American seaman, Matthew F. Maury, must be conceded the premier position as an exponent of the best possible tracks for sailing-ships on every sea. While serving on board the United States ship *Falmouth*, as sailing master, he conceived the plan of his world renowned "Wind and Current Charts," which subsequently effected a radical revolution in passage making. Anxious to make a rapid run round Cape Horn, Maury ransacked New York for the necessary information, but without avail. Later on, when in authority at Washington Observatory, he devoted his attention to the highly important subject of shortening passages, and utilised all the valuable data contained in log-books of United States warships, which were stowed away as so much rubbish, fit only for pulping. At the same time he collected meteorological observations from every reliable source relative to the then tedious voyage between Atlantic ports of the United States and Rio Janeiro. Navigators are not infrequently distrustful of any departure from the beaten track; and, therefore, it is not a matter for surprise that Maury's efforts were at first unappreciated. Captain Jackson of the Baltimore ship *H. W. D. C. Wright* became a convert, boldly followed the new route laid down for him, and had the gratification of completing the round voyage in an interval not exceeding that often occupied in making the outward passage on a less scientific basis. The time honoured rule-of-thumb, or individual experience, was badly beaten by the brilliant deductions of Maury from the records of many navigators in every kind of ship. He soon attracted many followers, and readily seized so favourable an opportunity to enlist the warm sympathy and close co-operation of American shipmasters. They responded right loyally, and Maury was thus induced to develop an international system on similar lines. The tabulation of the data on his "Wind and Current

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Charts" was carefully carried out by junior officers of the United States Navy whom Maury had inspired with his lofty enthusiasm; but the deductions therefrom, for the better guidance of navigators under every sky and under every flag, are solely due to the genius of Maury himself. The originality of his methods, and the merits of his results are unassailable. A Kepler, a Newton, and a Darwin, would have been impossible had precedent and privilege confronted them at every turn. Quite naturally the giant strides of Maury, then a lieutenant U.S.N., along the path of progress, did not fail in fostering a certain indefinable jealousy in the breasts of a few brother officers, and the greatest passage-shortener that the world has ever known was almost retired into obscurity. Mr. W. A. Graham, one time Secretary of the United States Navy, on that occasion, in a letter to Maury, wrote as follows:—"Indeed, I doubt whether the triumphs of navigation and the knowledge of the sea, achieved under your superintendence of the Observatory, will not contribute as much to an effective Naval Service and to the national fame as the brilliant trophies of our arms." This judgment has been confirmed by posterity. At a meeting of distinguished scientific men, held in London to honour Maury, it was pointed out by Sir John Pakington that the practical result of the American "Wind and Current Charts" was a marked decrease in the number of days occupied in making a passage. In this way the expense of a 1,000-ton ship from England to Rio Janeiro, or China, was lessened by £250; while the voyage of a similar ship to California, or Australia, and back, resulted in a saving of £1,200 or £1,300. Prior to the publication of his masterly charts the average passage under canvas from United States ports, north of Hatteras, to San Francisco, Cal., was 180 days. This knowledge of where to find a fair wind and a favourable current made it possible in 136 days. Similarly, from Europe and the United States to Melbourne, ships navigating without the charts were 124 days on an average, whereas vessels using Maury's charts did the distance with an average of 97 days. In 1868 Cambridge conferred upon him the degree of LL.D., and the translation of the Public Orator's speech shows the high estimation in which he was held. It may spur on some of our younger navigators to pay more attention to the study of ocean meteorology, so I give it a place here. "I present to you Matthew Fontaine Maury, who, while serving in the American Navy, did not permit the clear edge of his mind to be dulled, or his ardour for study to be dissipated, by the variety of his professional labours, or by his continual change of place, but who, by the attentive observation of the course of the winds, the climate, the currents of the seas and oceans, acquired those materials for knowledge, which afterwards in leisure, while he presided over the Observatory at Washington, he systematised in charts and a book which has carried the fame of its author into the most distant countries of the world." His "Physical Geography of the Sea" ran through twenty editions, and was translated into French, Dutch, Swedish, Spanish, and Italian. He died full of honours, a seaman of our near kindred whose life was devoted to the sea and seamen irrespective of flag, and in the words of the lament of the Virginia Senate, he was "an honour to Virginia, an honour to America, and an honour to civilisation, and in gracefully recognising this we do but honour ourselves." To Maury we really owe the conception of the North Atlantic Pilot Chart; though every month's chart is an improvement on its predecessor, as he would doubtless confess could he return from the shades.

Since the memorable day when Christopher Columbus and his sterling seamen set sail for the unknown west, in their tiny craft, the North Atlantic has become the principal ocean highway of nations. The fittest survive in ships and in shipmasters, as in other matters, and the packet-ships between New York and Liverpool afford a good example of what can be done with the wilful wind as a motive power provided the ships are sufficiently supplied with competent officers and men. Had not the "tea-kettle," as Admiral Rous dubbed the steam engine, come to the front, assisted by iron and steel in ship construction, we should probably have had still further advances towards quickness and handiness. As it happened, the marine engineer and his "black squad" drove such splendid sailing-ships from off the face of the waters. The master of one of those wild Atlantic boats enjoyed an income which would make the mouth of many a modern master water, even though he belong to a large line. Carrying on was reduced to a fine art, and the master necessarily combined in his person the attributes of a skilful sailor, a ready navigator, and a commercial clerk. In 1816 the Black Ball Line controlled the Atlantic passenger trade. Then the average quickest passage to the eastward was 23 days, and to the westward 40 days. Rather different from the 5½ days' yachting trip of *Lucania* or *Campania!* Men made their wills with due solemnity when compelled to take a trip in an early specimen of the Western Ocean Packet. A great Scotchman, Francis Jeffrey, the then editor of the *Edinburgh Review*, put the case of the passenger against the sailing-packet very forcibly. One of his objections was "the provoking uncertainty of your fate, now going 150 miles in one day on your way, and then taking seven days to do 100; the agreeable doubt whether your voyage is to last three weeks or three months." The Red Star, and the Swallow Tail, came in to compete, vessels were improved, passages shortened, and by 1822 there was a weekly packet system between New York and Liverpool. The Dramatic Line followed. The fate of the sailing-packet was irrevocably sealed on the day when the pioneer steamer *Great Western*, on her maiden passage, overhauled and soon left below the eastern horizon, the *South American*, of the celebrated Black Ball Line. Some of you will remember the once favourite chanty, "My love he is a Yankee and he sails in the Black Ball Line." The sailing-packet was beating to windward, and the Black Ball, in her deep topsail, slatted against the mast as she pitched into a heavy head sea. Even then, 15 days eastward, or 25 days westward, was a record worth having. The most famous of all the famous passage-making sailing-packets, was the *Dreadnought*, which under the command of Captain S. Samuels, eclipsed all previous passages, and has never been equalled. Not even one of the early steamships could pass the *Dreadnought* with all her sails full to a strong leading breeze. In 1854 she reached Sandy Hook as soon as the Cunard steamer *Canada*, which left Liverpool one day earlier, reached Boston. Five years later she went from Sandy Hook to the Rock Light, Liverpool, in 13 days 8 hours, and in 1860 from Sandy Hook to Queenstown in 9 days 17 hours. I visited her at San

Francisco just before her loss off Cape Horn, and found her a powerful ship then. She was 200 ft. long between perpendiculars, 40 ft. beam, 26 ft. deep, and 1,227 tons net register. Her topsails were single, her fore and main topgallant sails reefed, the studding-sail booms rove through irons underneath the yards, and the fore braces led to a short hemp pendant attached to the mainmast. The names of the good ship and her commander will never be forgotten so long as seamanship has any value at all in the market.

In 1851 the *Staffordshire* reached Liverpool from Boston in 14 days, and three years later, three ships whose names are familiar to us all, the *Lightning*, the *James Baines*, and the *Red Jacket*, made the same passage in 13 days. Yet nearly half a century later we cannot find anything to compare favourably with that class of ship. The best passages within my knowledge of British sailing-ships in the North Atlantic are those of the coolie-ships belonging to London and Liverpool. In 1880, the *Ailsa* went from Demerara to Liverpool in 23 days; in 1893, the *Volga* was only 21 days from Demerara to London; in 1894, the *Bann*, a three skysail-yard ship, took one day longer, and the *Rhine* reached Gravesend in 24 days from Trinidad. This year, the *Erne* came to Liverpool from Barbados in 22 days. In 1886, a schooner, the *Red Rose*, crossed from Labrador to Gibraltar in nine days. Turning to the other side of the picture, there is certainly some room for improvement. A handy iron barque, the *Viola*, left London for St. John, N.F., in January, 1894, but did not arrive there till April. She occupied 103 days on the passage, and gave the underwriters cause for serious anxiety. About the same time, the barque *Broomhall* was similarly engaged between Hamburg and New York. During her passage of 113 days, she got up between Greenland and Iceland to enjoy the rigours of the long wintry nights, lost sails and one man, had decks swept, and was generally unfortunate. In 1889, the German barque, *Duppel*, was 111 days on the passage from Liverpool to Philadelphia; and in 1894, the Italian brig, *Concezione Immacolata*, was 129 days going from Trapani to Halifax, N.S. Two years ago, the Norwegian barque, *Skibladner*, was 51 days from Sherbrooke, N.S., to Ayr. While the westward bound vessels were struggling against persistent head winds, ships sailing later had actually reached England from San Francisco, Cal., and Australian ports!

A weak vessel, or one undermanned, will do better by avoiding the more direct passage to American ports north of Hatteras. Let her proceed as though bound for the equator crossing until in 30° N. 20° W., then gradually edge away to the westward along the 24th parallel before the fair easterly breezes of that region to 60° W., and thence, aided by the Gulf Stream, make northing. In mid-Atlantic there is an area of high barometric pressure almost a fixture, though its centre oscillates slightly. The winds blow around it in the direction traversed by the hands of a watch. Consequently, the outward bound ship generally has a slant right from the Channel to the Doldrums, whereas the homeward bounder is compelled to keep well to the westward in order to take advantage of the southerly winds of this high barometer system. Navigators possessing the Washington Pilot Chart of the North Atlantic for the current month find the best possible tracks laid down for their guidance. In 1893, the *Ben Nevis*, New York to China, was 65 days getting down to the Atlantic equator. Probably the permanent area of high barometer was well over toward the American coast, she made too much easting, and got the maximum hindrance from the light variable winds of the central portion of this approximately stationary system. I am firmly convinced that one hour a week ungrudgingly devoted by a master to the instruction of his apprentices in just what the data on a United States Pilot Chart signify, would be far more valuable for owners, masters, and apprentices, than six times six hours spent in menial duties tending only to disgust the youngster with the nautical profession. Failing a Pilot Chart, the Admiralty Wind and Current Charts will serve the purpose admirably. Then again the apprentices would obtain a proficiency in meteorological matters, on which the length of a passage often depends, were they called upon to read the barometer every watch, together with the temperature of air and sea, subsequently entering the results neatly in the special Meteorological Log provided by the Meteorological Office, London; or on the forms supplied by the United States Hydrographic Office, which are less troublesome to fill up. Experience is a dear school. Emphatically expensive, if passage making be attempted based solely upon individual experience. Life is not long enough for anything but an imperfect generalisation if only one's own experience be relied upon. Still, every wind chart, or current chart, should be so constructed that the shipmaster shall be able to determine for himself whether the general information given on the chart is based on a large number of observations well spread over a series of years, or on a few observations from one ship. Otherwise probably the master's own experience would ensure a quicker passage than a reliance upon the chart.

Allan's sailing-ship *Gleniffer*, in 1871, made four voyages to Quebec and back during the eight months of St. Lawrence navigation, and another to New York within the year. Her shortest passage from Quebec to Greenock was 15 days. The *Robertson*, Captain Neil, in 1832, for the first time on record, made three voyages to Quebec and back to England in one season. The Quebec merchants rose to the occasion, and presented the master with a silver cup for his skill and enterprise. In 1891 the *Norman* made three voyages to Miramichi and back to England. The first modern four-masted sailing-ship, the *Great Republic*, Captain Limeburner, once reached the equator in 15 days from New York, or in less than a quarter of the interval occupied by the *Ben Nevis*. Franklin discovered the importance of the Gulf Stream to commerce as a factor in passage-making. Some merchants of Rhode Island petitioned the mother country in 1770 to compel the Falmouth packets to adopt the route followed by the cargo-carriers. Paradoxical as it seemed, the longer way round was the shorter way to the westward. It was accomplished on an average in less time. Captain Folger, a Nantucket whaling-master, gave the philosopher the hint that the Gulf Stream was adverse to the packets. Theoretically, the great circle track from port to port should be preferred as the shortest distance. It is often impracticable. Hence the need for a careful and competent grasp of the average winds, currents, and drifting dangers, before deciding upon a particular route. Crossing the North Atlantic with a liner carrying passengers, many matters must be considered.

Fog is too often prevalent on the Banks of Newfoundland to permit of any relaxation. Ice has been reported to Washington as far south as Cape Hatteras, the American Cape of Storms, in 72° W.; and east, right to 49° N. 24° W., in July, 1890. The lives of passengers are apparently more worth serious consideration than those of crews; for, curiously enough, just where competition keeps lines up to the highest efficiency in ships and men, there the most drastic official regulations are enforced. Nearly twenty years ago Messrs. Ismay, Imrie & Co., brought to the notice of the North Atlantic Steam Transport Conference a proposal to adopt definite routes for passenger steamships in order to lessen the risk of collision between ships proceeding in opposite directions, or with an iceberg. Maury had indicated safer routes than those usually followed, and the celebrated White Star Line agreed with his masterly deductions. In 1878 they approached the Board of Trade on this important question. Later on an agreement was arrived at, and now passenger steamships use the tracks laid down on the United States Pilot Chart every month. They are not the shortest, but they are the safest possible, having regard to rapidity and the dangers from ice, fog, and collision.

Prior to 1854 unwise tonnage laws led to the construction of sailing-ships which would not stand up in a breeze of wind. Every effort was put forth by shipbuilders to produce a class of vessel capable of carrying a large cargo on a small register tonnage. Human nature, if you please, but none the less reprehensible. The old builders' measurement was based upon the length and breadth of a ship. Her depth was neglected. This gave rise to narrow, deep ships, with flat sides and full bottoms. Having nothing to gain by evasion of a tonnage law, the American ship-designers and builders seized the golden opportunity afforded by our sacrifice of speed and safety on the altar of increased cargo carrying capacity. Their wooden ships were soon the admiration of every seaman. In 1855, in the principal docks of Liverpool, the American flag floated over a large majority of the ships; and our own flag, in our own port, was conspicuous by its absence. These Yankee clippers had lofty spars, an enormous spread of canvas, plenty of beam, crews which were both sufficient and efficient, and exceptional speed. Our own coffin ships either lay idle in China ports, unable to obtain a freight where American clippers were at a premium; or else, at sea, they would be under small canvas, consequent on want of stability and the presence of vicious qualities, when their rivals would be bowling along under skysails and royal studding sails, to the mortification of the British shipmaster, whose sterling seamanship was so heavily handicapped. Such an unsatisfactory state could not long continue. The first maritime nation of the world was not content to sit with folded hands in contemplative Oriental fatalism while the ocean carrying trade passed to its near kindred. The law which incited and encouraged speculative shipowners to build unsafe sailing-ships was repealed. Immediately there sprung into being British sailing-ships the like of which had never before been seen under any sky. Between 1860 and 1870 the sun of the seaman reached meridian altitude. The new British clippers were smaller than those of the United States. Until 1863 they were wooden ships. Subsequently composite craft came into favour. The *Lord of the Isles*, 770 tons, was the only iron China clipper. Under Captain Maxton, in 1856, she beat the record, Foochoofoo to London, and discharged her cargo in prime condition; whereas the soft-wood American ships pitted against her, the *Maury* and the *Fletcher*, had much of their tea ruined by salt water owing to carrying on and straining in heavy weather. A prize of £1 per ton was given to the first ship of the season, and fabulous sums depended upon the result. The average tonnage of our China clippers was about 800. Only one, the *Oberon*, exceeded 1,000 tons. The composite *Sir Launcelot*, built at Greenock in 1865, was 886 tons register, 197 ft. long, 33 ft. 7 in. broad, and 27 ft. deep. She had nearly 100 tons of iron ballast fitted into the spaces along the keelson between the frames. Her spread of 46,000 square feet of canvas made this a necessity. In 1869 she came from Foochoofoo to London in 90 days, thus beating the *Thermopylæ* by one day. In 1866 the *Ariel*, *Taeping*, *Serica*, *Fiery Cross*, and *Taitsing* raced home. The three first sailed on the same day, did not sight each other again till in the English Channel, and arrived in the Thames within an interval of a few hours, after a passage of 99 days. The maximum distance run in 24 hours by these ships was 317, 319, 291, 328, and 318 knots respectively. Messrs. Green, of Blackwall, built the *Challenger*, which raced home against the American clipper, *Challenge*, from Anjer in 62 days, and beat her rival by two days. A yarn went round the newspapers, which if not true is well told, that in this particular race ship was staked against ship. Anyway the *Challenger* was built for victory, and admirably accomplished her purpose. On another occasion this ship beat the American clippers, *Nightingale* and *John Bertram*. The backers of the *Challenger* won stakes amounting to £4,000. I saw the *John Bertram*, fallen upon evil times, unloading lumber in the Surrey Commercial Dock, in 1883, under the Norwegian flag, of course, and she met her fate in harness two years later while carrying petroleum from New York to Europe. She was a fast ship to the last. Several of the old China clippers are still left to us, notably the *Sir Launcelot* and the *Thermopylæ*. No more beautiful models, no swifter ships, have ever graced the surface of old ocean. Sharp as desirable under water, though of proportions proper for stability; lofty to a degree that does not find favour now for several reasons; they were the embodiment of a seaman's highest aspirations in that way. I have often lingered lovingly in the East India Dock gazing on the trim fleet of Aberdeen White Star clippers, and deeply regretting the absence of famous ships which drop out at intervals. The steamers of the same line temper this regret in some measure, being equally good models; not straight-stemmers, which may be more useful, but are decidedly less ornamental.

The China clippers were not alone, and the sun of the wooden sailing passenger-ship sank below the horizon in a glory worthy of so famous a fleet. Along the lone Southern Ocean there sailed most powerful ships under the British flag. They were larger than the China clippers, but not one of them equalled in rapidity Messrs. Geo. Thompson's yacht-like *Thermopylæ*, of 948 tons register, 210 ft. long, 36 ft. broad, and 21 ft. deep. She no longer flies the Aberdeen White Star. Her first trip to Melbourne was accomplished in 60 days, the fastest on record, under Captain Kemball. She was about 26 days from the meridian of Tristan d'Acunha, to

Melbourne, and but 21 from the meridian of the Cape to Melbourne, along the 43rd parallel to 120° E., and thence to her port. She next went from Sydney to Shanghai in 28 days, a record that has not been approached within a week. With all sail set she carried about one quarter more canvas than a ship of her size to-day. On the other hand she is said to have had a crew of 48 all told, or three times as many as the modern cargo-carrying sailing-vessel of 1,000 tons register. Five years ago she was altered from ship to barque, and sold to Victoria B.C. Since then, carrying lumber from Victoria to Shanghai, her average passage was 43 days. From Cape Flattery to Hong Kong, by way of the Hawaiian Islands, she covered the distance in the record interval of 39 days. On her last trip from Shanghai to Victoria, notwithstanding five days' head wind, she made the passage in 29 days, breaking all previous records, including her own. An exact model of this ship ought to find a place in every collection of such objects worthy of the name, especially at South Kensington, for the day is not far distant perhaps when her class will be as extinct as the Dodo. Even officers and seamen may be of a different breed !

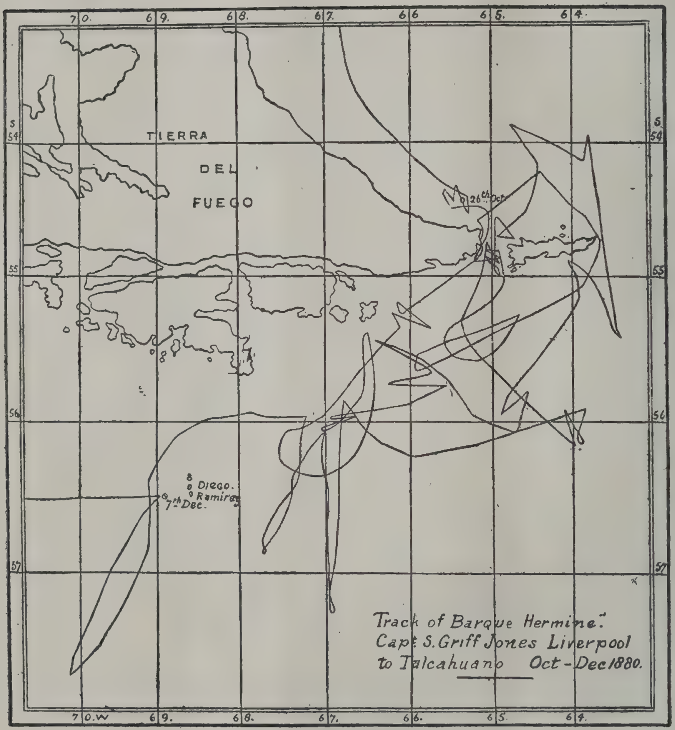
Along the route to Australia, the greatest advantage can be taken of great circle, or of composite sailing. The dangers and difficulties of a southern passage have perhaps been unduly exaggerated. Give a dog a bad name and it will stick to the animal. Those who have been there are not so unfavourably impressed as those who look upon the sea from dry land. Ice is likely to be fallen in with on any parallel south of 40° S. This year the sailing-ship *Queen Mab* had seven bergs in sight, when in 35° 30′ S., 20° 45′ E., about 55 miles south-east of Cape Agulhas, on 6th August last. With a competent crew, and a good ship, the chances of a quick passage probably increase with the latitude up to a limit fixed by low temperature, long nights, and thick weather. H.M.S. *Havannah* kept north of 39° S., and went from the Cape of Good Hope to Sydney in 34 days during August and September. Flinders made three passages, but avoided going south, fearing to fall in with stronger winds than he could fully utilise. In 37° S. he averaged 150 miles a day in the old collier-built *Investigator*. We have better constructed ships now, and ice is apparently not more formidable on one parallel than another. Take the experience of two members of this Society, Captain E. J. Evans and Captain W. C. Crutchley, R.N.R. The former, in 23 round voyages of Shaw, Savill's R.M.S. *Tainui* to New Zealand and Home, *viâ* Capes, did not sight any ice on the outward passage, and only one berg on the homeward passage. During her last five voyages, however, ice was seen on three outward passages and one homeward. The latter, in the New Zealand Shipping Company's R.M.S. *Kaikoura*, generally following on *Tainui*, made 15 voyages, between 45° S. and 54° S., yet only saw ice twice, a small berg off the Crozets in April, 1894, and a few small scattered bergs in 50° S., 100° E. Captain C. M. W. Hepworth, R.N.R., not long since said that in 14 voyages of the Port Line steamers, running down the easting south of 40° S., often below 44° S., ice was only met with once. He recommended 41° S., or 42° S., in southern summer; 45° S., or 46° S., in southern winter. Any one desirous of estimating the ice risk of late years will find every information in the *Nautical Magazine* in so far as the lone Southern Ocean is concerned. Exercises in elementary arithmetic will not help to exactness in determining the parallel on which ice is likely to be least frequent. Averages are apt to disguise the facts. Fog, mist, and haze, may be three distinct items in the shore-dwellers' *vade mecum* of meteorology, but are often practically the same in endangering the safety of a ship. Maury thought that 46° S. was a favourable parallel for running the easting down. There the gales if rough are honest. Sudden shifts are not so common as in other oceans where cyclones are well in evidence. Splendid sailing-ships earned renown in high southern latitudes, carrying eager hearts and willing hands to the Antipodes. In 1855, the *Donald McKay*, named after the famous Boston builder of clipper ships, was sighted under moonsail, skysails, and royal studding-sails. The *Marco Polo*, Clarke, was fitted with Cunninghame's patent topsails, and once reduced from royals to double reefs in 20 minutes. I have been shipmates with that patent, with old fashioned topsails, also with double topsails, and prefer the latter before all others. A passage is easily spoiled should a patent topsail yard carry away in the slings. In 1856, the *James Baines*, named after a Liverpool shipowner gone to his last resting place, went 21 knots, in 41° S., 114° E., with main skysail set. It is rather difficult to realise such carrying on to make a passage. The fact is clearly recorded in her meteorological log where the wind force is entered as that of a fresh gale. Two days previously under the same canvas, going 17 knots with a strong south-west gale, she passed a ship just jogging along the same way under close reef topsails! Her master evidently thought it was better to be sure than sorry, a record passage notwithstanding. Perhaps some such carrying on in olden times may have given rise to the legend of the Flying Dutchman. Green's *Melbourne*, under Captain R. Marsden, in 1876, sailed 5,129 knots in 17 consecutive days. Her best days' run was 374 knots. In 1893, the *Cutty Sark*, one of the old clippers, made 2,180 knots in 7 days, and for 11 days averaged 362 miles a day. Her best run was 353 knots in twenty-four hours.

Just as in the North Atlantic the principal steamship lines have adopted safety routes, so still more recently similar action has been taken for the Southern Ocean. The route agreed upon is followed by the Ducal, Lund, New Zealand Shipping, the Port, and the Shire lines. From the Cape to Australia the safety route crosses 40° E. in 42° 30′ S., and each tenth degree meridian eastward in 45°, 45° 40′, 46° 20′, 47°, 47° 15′, 47°, 46° 50′, 46° 35′, and 46° 20′ S. From New Zealand to Cape Horn the track crosses 160° W. in 50° S., and each tenth degree onward in 50° 45′, 51° 30′, 52° 10′, 52° 45′, 53° 20′, 53° 45′, 54° 25′, and 55° S. From the terminal positions the route is optional, and will vary with the port sought. The Shaw, Savill and Albion Co., urge reasons for standing out which are worthy of consideration. It is just such discussions that tend to perfecting the world's knowledge of the best ocean routes. In my opinion, with a well found ship, the danger is not greater by the southern passage either from ice or thick weather. Still cold and general discomfort must not be ignored for passenger ships. Before steam drove the sailing-packets off this route the latter went far south, passengers were unable to keep the deck, and complaints were rife. Among the quickest sailing-ship passages over the Southern ocean during the past few years are the *Mayhill*, Downs to Melbourne, 75 days; the four-master *Royal Forth*, Rio to Newcastle, N.S.W., 60 days; the *St. Mildred*, Bristol Channel to Port Pirie, 63 days; the *Oweenee*, Prawle Point to Port Pirie, 66 days; and the *Lord Spencer*, Cape Town to Newcastle, N.S.W., 29 days. Not one compares favourably with the famous *Thermopylæ* now bound to England from Puget Sound. They, however, tend to show that the sailing-ship is at her best along this wide stretch of water.

Cape Horn has an evil reputation, founded upon some terrible trials of ships and their crews. This year has afforded a fair sample of the weather met with there. Ship after ship encountered persistent westerly gales and suffered serious damage in many instances. A large number were compelled to put back for the Falklands in distress, where expenses are said to be exceptionally heavy, due to monopoly. This fact merely serves to enforce my view that weak ships should keep away from Cape Horn altogether. A far better plan is to proceed for Bass's Strait, or New Zealand, directly, and so into the Pacific. I am well aware that the route from Australia and New Zealand to the west coast ports of North America is little known even now. Here the delay is likely to creep in from light variable winds, but granting this, the whole passage from a home port to San Francisco, for example, will occupy less time than attempting Cape Horn. I have, therefore, devoted much attention to a discussion of this part of the passage. The route is longer by about 5,000 miles, but very often the saving will be most marked. A British iron ship, the *Old Kensington*, quite recently put back to the Falklands to repair damages. She is reported to have incurred a bill of £3,300 for labour alone, and the total expenditure was £6,200, exclusive of £500 worth of material sent out from England. The *Thomas Stephens* left Swansea for San Francisco in December last, and was off the Horn in February. She got so roughly mauled by heavy westerly gales that the Falklands had to be sought. While there her master received instructions from her owners to make for Cape Town. She arrived there in May, and sailed again within six weeks re-sparred, re-rigged, and thoroughly repaired in less time and at less expense.

The *Bankhall* left London last May for Chili, in ballast, not an unusual thing in these days of low outward freights. She could not round the Horn. Rigging, spars, and sails were covered with ice. On the 1st August she gave up the passage and made for Newcastle, N.S.W., where a coal cargo might be obtained. She passed the meridian of the Cape of Good Hope on the 17th August, ran her easting down in 40° S., and was off Cape Otway on the 8th September, out 110 days, having lost a month off Cape Horn. My son, an apprentice on board the *Crown of Denmark*, was off the Horn at the same time, and his description of the weather confirms the above in every particular. She got round without damage, but was one month longer than on the previous outward passage. In 1892 the *Australia* was sixty days off the Horn; the *Hawaiian Isles*, another big ship, lost heart after a fair trial to get westward and ran towards Australia. She was 189 days on the passage from Swansea to San Francisco, and sixty guineas paid for re-insurance. In 1894 the American wooden ship *Louisiana* was 212 days from New York to San Francisco. She got off the Horn, turned round, and ran north-east to 43° S. 32° W., thence kept pointed for Bass's Strait till 100° E. was reached, and then she kept away and passed south of Tasmania, but north of New Zealand. On her way she fell in with many icebergs from 2° W. to 15° E. That year the *Harland* was 182 days following the same route to San Diego. A German barque, the *Matador*, got round the Horn, after a hard trial of strength. She was 163 days from Shields to Valparaiso, and 93 per cent, was paid on her. In 1890, the *Bedfordshire* was 156 days from Shields to Iquique. Fifty guineas was obtained for re-insurance. The accompanying track of the barque *Hermine* gives a faint idea of the weary waiting for a slant off Cape Horn. Perhaps deep laden sailing-ships bound for ports on the west coast of South America might find an easier and quicker route by steering boldly eastward for the Antipodes. At any rate an opinion is desirable whether anything is to be gained by hugging the land so closely as is usual. If the Horn is to be rounded at all costs would it not be better to stand south, making as much westing as possible, and then go on the other tack? Beating against a continuation of heavy westerly gales is a physical impossibility. A master who had rounded the Horn many times in the copper ore trade, Captain James Gales, referring to the persistent head wind, said: "There is the enemy, lick him if you can, and if you cannot, steer away south and turn his flanks."

If only Cape Horn be nicely cleared a quick passage is possible to the westward. In 1881 the *Oberon* went from Liverpool to Honolulu in 110 days. This passage had been previously accomplished in 100 days from London. The four-masted barque *Alcedo*, in 1893, reached San Francisco from Liverpool in 104 days. The *Glamis* was 100 days from London to San Diego in 1890. Still quicker passages to San Francisco are the American ships *Flying Fish* 92 days in 1853, *Flying Cloud* 89 days in 1854, *Great Republic* 92 days in 1857, *Andrew Jackson* 90 days in 1860, and quite recently *Jabez Howes* 107 days, and *Henry B. Hyde*



Track of Barque Hermine. Capt S. Griff Jones Liverpool to Talcahuano Oct-Dec 1880.

108 days. These six ships were all from New York. The British ship *Merioneth* was 96 days from Cardiff, and the *Sierra Parima* 105 days from Liverpool to San Francisco. Two years ago the *Naiad* went from Liverpool to Valparaiso in 72 days.

Quick passages eastward are numerous, though the record from San Francisco to Queenstown is 90 days. The *Sovereign of the Seas* once went from Honolulu to New York in 82 days. She had an oil cargo, and is said to have covered the distance of 10,000 miles without either tacking or wearing. In one 24 hours she did 419 miles. This year the iron ship *Kenilworth*, British built but American owned, made the same run in 91 days. The *Northern Light* is said to have gone from San Francisco to New York in 75 days, in ballast trim; and the *Trade Wind* with full cargo in 84 days. All three of these were American clippers. Of late years the quickest passages from San Francisco to Queenstown are *Falls of Garry* 90 days, *Andelana* 90 days, *Ennerdale* 93 days, to Liverpool, *Henry B. Hyde* 95 days and *Dawpool* 99 days. In 1892, the *Loch Torridon* came to London from Sydney, N.S.W., in 82 days, and this year, the *Canada*, to Liverpool, in 87 days. From Portland, Oregon, to Queenstown, the *Machrihanish* was only 91 days, the *Vanduara* 108; and to Falmouth the *Sutherlandshire* was 99 days. The record passage under steam from New Zealand is that of the *Arawa*, of the Shaw Savill and Albion Co., 34 days 23 hours, or, including stoppages at Rio and Teneriffe, 36 days 12 hours.

Long passages eastward round Cape Horn are not unknown. A foul ship cannot possibly make a rapid run, and there is not any alternative route in this case. In 1893, the American wooden ship *Edward O'Brien* was 218 days from Tacoma to London. Fifty guineas per cent. had been paid on her. The ill-fated *Port Yarrock*, with her scurvy-stricken, scanty crew, subsequently lost with all hands in Brandon Bay, was 200 days from Santa Rosalia. A German barque, the *Henny*, holds the unenviable record for the longest passage from the westward round Cape Horn. She was 232 days from Corinto to Queenstown, and was only spoken once when in 48° S., 99° W. The iron ship *Timaru* has just put in 145 days between Melbourne and Plymouth. Homeward bounders are often endangered by ice in the South Atlantic. Since November, 1891, reports of huge icebergs north-east of Cape Horn have been exceedingly numerous. Captain Andrew, of the *Cromdale*, had one 1,000 ft. high, in 46° S. 36° W., in April, 1892, and the *Loch Torridon*, Captain Pattman, one 1,500 ft. high in 53° S. 46° W. Probably the best course to pursue is to sight both Staten Island and the Falklands. If wind will permit, keep westward of the latter, and thus lessen the risk from ice. At any rate, should the wind not serve for the inside route, keep close to the eastward of the Falklands, and make as much northing as possible after clearing them. Very commonly, ships are found in 40° W., when on the 50th parallel of south latitude, or just precisely where the danger from ice is at a maximum. A sailing-ship cannot always pick and choose a route, and may be compelled to stand on into a more dangerous part of the South Atlantic. With a steamship, however, there is an opportunity offered for discretion just here. West of the Falklands would tend to safety, whether for sail or steam, and would not lengthen the passage appreciably. Unless, and until, the narrow neck of land joining North and South America is pierced by a navigable waterway, Cape Horn will always have to be dealt with by navigators. An old adage says that, what can't be cured by pushing and striving, can often be effected by a little contriving. Perhaps the avoidance of the Horn, when outward bound from Europe to a Pacific port, would pay better than pile driving against the prevalent westerly gales and heavy sea.

The trade between Australia and the west coast ports of America is one of the features of the Victorian era. In 1829, Newcastle, N.S.W., was first mentioned, apparently as a coal port. In that year 800 tons, value £400, were brought to the surface in the vicinity. The only means of communication with Sydney was a cutter, the *Lord Liverpool*, which was frequently from 14 to 21 days on the passage. In 1871, no less than 790,143 tons of coal, valued at £274,000 was raised in the northern coal-fields. Of this, 565,000 tons was exported. That year 1,040 vessels of 376,000 tons, exclusive of coasting craft, left Newcastle. Last September there were actually on the way, from that coal port to San

Francisco, 18 sailing-ships of a total net register of 33,000 tons, and 28 more of 50,000 net register tonnage were either loading or chartered. Seventeen of these were above 2,000 tons register, including five exceeding 2,500 tons. Hence the desirability, increasing every day, of a better acquaintance with the best possible route across the Pacific from Australia and New Zealand to the west coast ports of the Americas, from the nitrate ports right up north to Puget Sound. And this more especially having regard to the fact that 38 of the 46 above-mentioned ships were under the British red ensign. The illustrious Maury thought the passage between Australia and California ought to be made in from 45 to 50 days, and occasionally by clipper ships in 37 days. Were the best routes as well known as in the North Atlantic, his estimate seems not far from the truth. The fastest on record between Newcastle, N.S.W., and San Francisco, Cal., within my knowledge, is the *Duchess of Argyle* in 1879, only 45 days. The *Borrowdale* and the *Min-y-Don* both crossed in 46 days from Sydney. Passages of 50 days and under are like angels' visits. The *Airlie* in 1878 was 50, the *City of Madrid* in 1879 was 47, the *Superb* in 1883 was 50, the *Thessalus* in 1886, 50; the *Waterloo* in 1889, 49; the *Talus* in 1891, 49; the *Eulomene* in 1893, 48; and the *Osborne* in 1889, 47 days, are at the head of the list. Captain Bennett commanded both the *Talus* and the *Thessalus*. Occasionally the passage from San Francisco to Queenstown is accomplished in less time than from Australia to San Francisco. Less seldom, quicker time is made from England, or the Eastern States, to San Francisco. So far as I am aware, the longest passage from Newcastle, N.S.W., to San Francisco is the 100 days of the *British Envoy*, from December, 1882, to March, 1883. In 1886 alone, when the *Thessalus* made the record for that year—50 days, the *King Malcolm* was 91, the *Strathearn* and the *Amoy* were 92, the *Lady Octavia* was 93, and the *Austria* 98 days, accomplishing the same distance. Crossing from San Francisco to Australia, the passage is said to have been made in 40 days. Unfortunately I am not able either to confirm or to disprove this statement. This, at least, is certain. In 1888 the *Seiriol Wyn*, a handy-looking barque, was 137 days from Port Townsend to

Melbourne; in 1893 the *Natuna* was 133 days from Vancouver to Hobart; and this year the *Earl of Hopetoun* took 157 days from Tatoosh to Adelaide, to the confusion of underwriters, who had paid 80 guineas per cent. to re-insure her. Both the *Seiriol Wyn* and the *Natuna* made exceptionally long passages on other routes.

Fast passages in the South Pacific are not so well known to me. Three, however, are worthy of special mention. In 1892 the *Edenballymore* went from Melbourne to Valparaiso in 32 days, and in the following year the *Star of Austria* and the *St. Mildred* made the passage from Newcastle, N.S.W., in 33 and 35 days respectively. That same year the *Manydown* was 114 days from Rio to Valparaiso, or 36 days more than the *Drumcraig* took in 1890 from Lyttelton, New Zealand, to Queenstown. The *Star of Austria*, a splendid ship belonging to a first-class line, has just been posted as missing. It is noticeable that there was not a boy or an ordinary seaman in her crew of 29 all told. Yet if we are to keep up the record we must train sailors of British birth. Had the *Manydown* kept clear of Cape Horn and proceeded eastward she would probably have gained 25 days.

I have to thank the Council of the Meteorological Office for readily granting me permission to avail myself of the valuable information to be obtained from the meteorological log-books kept by masters and officers of the British Merchant Navy specially for that office. Results must be arrived at by tabulating and comparing the experience of very many. Having tabulated the position of each of 76 sailing-ships, proceeding from eastern Australia to California and Oregon, on each fifth day, it is not difficult to determine upon a tentative best possible route. Ten ships from New Zealand to the west coast of North America also afford a fair idea of the southern passage taken in conjunction with 9 of the 76 from Australia which went south of New Zealand. The equator was crossed anywhere between 116° W. and 179° E. And this irrespective of month; although the large majority crossed from June to October, both months inclusive. Too far towards South America, or too far in the opposite direction, meant a decided increase in the average length of the passage expressed in days.

Apparently some masters evince a decided disinclination to venture among the islands. They kept steering eastward, until 106° W. was reached in some instances before attempting to make northing. This is more especially noticeable with ships keeping south of New Zealand, or sailing from a New Zealand port. In the accompanying table I exclude the 10 ships from New Zealand so that the data there given shall be strictly comparable. I have split up the crossings into belts of 5° or 10° of longitude; worked out the average number of days occupied on the passage to San Diego, San Francisco, or Portland; and given the number of ships using each such belt. The actual meridian most affected by our carrying craft was 158° W., but the five passages varied from 59 days to 77 days. All of the ships were iron or steel, except six, and they include some of the finest sailing-ships afloat to-day under the British flag. One was an American wooden ship.

PASSAGE TABLE. AUSTRALIA TO CALIFORNIA OR OREGON.

Meridian of Crossing.	Days on Passage.	Number of Ships.
115°—119°	78	2
120—124	76	3
125—129	74	8
130—134	66	8
135—139	61	2
140—144	—	—
145—149	57	7
150—154	61	10
155—164	65	19
165—174	65	11
175 W.—179 E.	66	6

The most rapid passages of these 76 ships were made by crossing the equator between 148° W. and 158° W. The fastest between New Zealand and Portland, Oregon, was the *Taranaki*, 48 days. She crossed the equator in 134° W. Taking the total days at sea of the whole 86 ships, including the 10 from New Zealand, the number is, roughly speaking, about 5,550 days, so that the average passage is about 65 days. Of this large number, there were only 180 days on which the wind force was eight, or above, of Beaufort's scale; and there were 340 days of calms, or light variable wind, in which a ship would go from two to three knots. The 88 gales were fairly distributed over the cardinal points; but, if anything, those from S., S.E., and E., were fewer than from the remaining points of the compass. The maximum wind force rarely exceeded 10 of Beaufort's scale, and the wind changes gave evidence that cyclonic circulations are often met with both north and south of the equator in the Pacific.

Stationary systems of high barometric pressure are often more troublesome to the master anxious to make a quick run than the moving systems of low barometer. In the North and South Atlantic the distribution of atmospheric pressure, measured by the height of the mercury in a barometer, is somewhat similar to that of the North and South Atlantic respectively. Authorities are not agreed as to the exact average positions of these areas where light breezes, calms, variables, and a high barometer reading will be encountered. Roughly speaking in the North Pacific this region for avoidance is elliptical in form. The major axis extends along the 30th parallel of north latitude from the west coast of North America to 160° E. for about nine months of the year, and to 170° W. during the remaining three. Although almost stationary, it varies occasionally both in geographical position and absolute size; and the minor axis stretching north and south is longer or shorter with the seasons. In the South Pacific the major axis of the high barometer, or anti-cyclonic system, lies along the 30th parallel of south latitude from the west coast of South America to 135° W. The minor axis acts similarly to that of the northern high pressure. Hence, whether in the North Atlantic bound to Europe, or in the North Pacific bound to California or Oregon, the quickest passages from the equator will be made by skirting the western portion of the high barometer area. To go too far east is courting delay from the light head winds of the eastern segment of the northern high pressure system.

Since the United States Hydrographic Office have commenced the publication of a monthly Pilot Chart of the North Pacific, it has placed before navigators much more reliable information with respect to the winds and currents of that ocean than were hitherto available. The following tables of the limits of North Pacific trade winds are copied from the current number of this very valuable series :—

NORTHERN LIMITS OF THE NORTH-EAST TRADES.

	100° W.	110° W.	120° W.	130° W.	140° W.	150° W.	160° W.	170° W.	180° W.
	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '
January ..	—	13 30	21 30	28 00	27 30	23 00	23 30	24 30	24 00
February..	—	—	27 30	28 00	29 30	28 00	24 30	22 30	22 00
March ..	—	—	24 30	25 30	26 30	26 00	24 30	24 00	23 00
April ..	—	—	27 00	29 00	30 00	28 30	28 30	29 00	28 30
May	—	—	28 00	27 30	30 00	28 00	27 30	26 30	27 00
June	—	—	30 30	31 30	31 30	31 00	31 30	30 00	—
July	—	—	—	33 30	34 00	33 00	33 00	33 00	34 00
August ..	—	—	—	34 00	34 30	33 30	32 30	32 30	32 00
September	—	—	—	30 30	31 30	29 30	30 00	30 00	30 30
October ..	—	—	22 30	28 30	30 00	29 30	28 30	28 00	28 00
November..	—	—	24 00	28 00	29 00	28 30	27 30	26 00	26 00
December..	—	—	24 00	27 30	28 30	28 00	26 30	25 00	25 00

SOUTHERN LIMITS OF THE NORTH-EAST TRADES.

	100° W.	110° W.	120° W.	130° W.	140° W.	150° W.	160° W.	170° W.	180° W.
	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '	N. ° '
January ..	8 30	8 00	8 30	8 00	6 00	5 00	4 00	3 00	3 00
February..	—	5 30	6 30	6 00	6 00	5 00	6 00	7 30	8 00
March ..	—	6 30	6 30	5 00	4 30	4 30	4 30	4 00	4 00
April ..	—	6 00	6 30	6 30	6 00	6 00	6 00	5 30	6 00
May	—	10 00	9 00	8 30	8 00	8 00	7 00	5 30	5 30
June	—	11 00	12 00	11 30	10 00	9 30	9 00	7 30	7 00
July	—	14 00	14 30	13 30	11 30	9 00	7 30	6 30	6 00
August ..	—	—	15 30	14 00	10 30	9 30	9 00	7 30	7 30
September	—	14 30	15 00	14 00	12 00	11 30	11 00	11 00	11 00
October ..	—	—	13 30	13 00	11 30	10 00	11 00	9 30	5 30
November..	—	11 00	11 00	11 00	10 30	9 30	8 30	7 30	6 00
December..	—	8 00	9 30	9 30	9 00	8 30	7 30	6 00	5 00

NORTHERN LIMITS OF THE SOUTH-EAST TRADES.

	100° W.	110° W.	120° W.	130° W.	140° W.	150° W.	160° W.	170° W.	180° W.
	N. ° '	*N.* ° '	*N.* ° '	*N.* ° '	*N.* ° '	*N.* ° '	*N.* ° '	*N.* ° '	*N.* ° '
January ..	4 30	4 00	5 30	4 30	4 00	3 00	2 00	1 30	1 00
February..	—	3 00	4 00	4 00	5 00	—	—	—	—
March ..	—	3 00	3 30	3 00	3 00	2 00	2 00	0 30	—
April ..	—	3 00	3 30	3 30	3 00	2 30	2 00	1 00	—
May	—	4 00	5 00	4 00	4 30	4 30	3 30	2 00	—
June.. ..	—	5 30	8 00	7 00	6 00	5 30	4 30	3 30	3 00
July	—	7 00	7 00	7 30	7 30	7 00	5 00	4 00	3 00
August ..	—	8 00	8 00	8 00	8 00	7 30	6 00	5 00	4 30
September	—	7 00	9 00	9 30	9 00	7 30	7 30	7 00	6 30
October ..	—	6 00	5 30	7 30	8 30	8 00	7 30	7 00	—
November..	—	6 00	6 30	7 30	6 30	5 00	4 00	3 30	3 00
December..	—	5 30	6 00	6 30	6 00	5 30	4 30	3 00	2 30

SOUTHERN LIMITS OF THE SOUTH-EAST TRADES.

	80° W.	90° W.	100° W.	110° W.	120° W.	130° W.	140° W.	150° W.	160° W.	170° W.	180° W.
	S. ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '	*S.* ° '
Jan. ..	28 30	29 00	26 00	20 00	29 00	24 30	—	24 00	31 30	25 00	—
Feb. ..	30 00	28 30	23 00	15 30	25 30	30 00	—	26 00	28 00	—	33 00
March ..	27 30	27 30	24 00	15 00	22 00	23 30	—	24 30	20 00	24 30	—
April ..	27 00	26 30	25 00	18 00	26 30	25 30	—	18 30	24 00	32 00	33 00
May ..	25 00	24 00	20 30	18 30	20 00	23 00	—	16 00	28 00	26 00	—
June ..	19 00	24 30	23 00	24 00	22 00	25 00	—	19 00	23 30	26 00	—
July ..	28 00	27 00	21 00	24 30	26 00	21 30	—	17 30	20 00	27 00	27 00
August..	28 30	24 30	23 30	18 30	18 00	25 00	—	18 00	26 00	25 00	28 30
Sept. ..	21 00	23 00	23 30	22 00	19 30	23 00	—	18 30	24 30	26 00	—
Oct. ..	26 00	27 30	24 00	22 00	23 00	24 00	—	20 00	23 30	26 00	25 30
Nov. ..	30 30	28 30	24 00	21 00	19 00	22 30	—	21 30	24 00	24 00	—
Dec. ..	29 00	29 00	29 00	23 00	21 00	25 30	—	24 30	23 00	29 30	33 00

The above tables are based on the very latest information, and should be valuable for reference. The northern and southern limits of the north-east trades, and the northern limits of the south-east trades, are taken from the most recent numbers of the North Pacific Pilot Chart. The southern limit of the south-east trades has been deduced from a careful consideration of nearly 1,500 trade wind reports returned by shipmasters of every nation to the Washington Hydrographic Office during the period 1885-1890.

Not every navigator has a Pilot Chart, and therefore a statement of equator crossing for ships bound north in the Pacific, from Cape Horn or the west coast of South America, will be a good thing to have from that source :—

Route.	Month of Crossing.	Longitude of Crossing.	Lose S.E. Trades. Prob. lat.	Enter N.E. Trades. Prob. lat.	Lose N.E. Trades. Prob. lat.
		W. ° ′	*N.* ° ′	*N.* ° ′	*N.* ° ′
For U.S.A.	January ..	113 45	4 30	8 15	25 30
,,	February .	114 00	3 45	6 30	28 00
,,	March ..	112 30	2 45	6 00	25 15
,,	April ..	116 45	3 30	6 15	29 00
,,	May ..	117 30	4 45	9 15	29 10
,,	June ..	117 30	6 00	11 00	31 30
,,	July ..	118 00	7 00	14 30	33 00
,,	August ..	118 00	8 00	13 00	34 00
,,	September	118 0	9 00	13 00	34 30
,,	October ..	118 0	6 30	11 30	33 45
,,	November.	118 20	7 00	9 10	31 45
,,	December.	117 30	6 00	8 00	30 00

The Pacific is becoming every day of more importance in the ocean carrying trade. A new line of sailing-ships and steamers has recently been founded to carry lumber from Puget Sound ports to South Africa. Honolulu is sending much more sugar than formerly to the United States. An increasing trade is opening out with Noumea, New Caledonia, and in 1893 a large steamship from Hull arrived there in ballast and loaded 5,000 tons of nickel ore for Glasgow. Very little is known of the best way home from Noumea. Shall a quicker passage be made by going east or west? Shipmasters can do very much to improve the world's knowledge of ocean meteorology, for without sufficient observations wind and current charts are worse than useless, they are misleading. The temperature of the sea surface is useless as a guide to the proximity of ice. Yet the observations taken regularly on board every large liner may assist in shortening a passage. In 1878, Captain J. McKirdy, R.N.R., now Marine Superintendent of the Shaw Savill and Albion Co., whom we all know, was in command of the steamship *Peruvian* trading between Honolulu and Callao. He fell in with a strong north-westerly current where he expected in accordance with the chart to have the equatorial counter current.

He availed himself of this newly won information on the return trip, and gained considerably on each day's run. The colour of this river in the ocean was dark green, and the sea surface temperature by its fall and rise served to indicate when in or out of the current. A somewhat similar praiseworthy appreciation is recorded of Captain Roberts who left Wilmington with a blockade runner in thick weather, and next day observed a Federal cruiser gaining on her. Captain Roberts fortunately noted the ripple on the Gulf Stream margin, edged away for the favourable current, and showed the pursuer a clean pair of heels. He did not mention the sea surface temperature, though this would probably have helped him towards his decision.

The two British ships which proceeded to California ports by avoiding Cape Horn altogether, acted differently in making the passage across the Pacific. The *Wasdale*, in 1876, was 81 days to 49° S. 147° E., crossed the 180th meridian in 50° S., and crossed the equator in 130° W. She was 136 days from Liverpool to San Francisco, arriving in December. The *MacMillan* took the northern route and arrived at San Diego in 128 days. On the 78th day from the Lizard she was in 39° S. 147° E., passed through Bass's Strait, crossed the equator in 155° W., and reached San Diego in 128 days from Antwerp. The German barque *Jupiter*, that left about the same time, was 131 days between the same two ports by way of Cape Horn, both arriving in September. Curiously enough I have a comparison between the *Wasdale* and the *Glencaird* between Liverpool and San Francisco, June to November, 1889, when the former was 157 days by way of Cape Horn, and the latter 156 days by way of the Cape of Good Hope. I am uncertain whether the *Glencaird* made any attempt to round the Horn. Everything tends to prove that under certain conditions ships bound to ports in California, or to the northward thereof, will make an equally quick, if not a quicker, passage by going through Bass's Strait, or between Tasmania and New Zealand, or south of New Zealand. I have not come across a single instance in which a ship went through Cook Strait.

Homeward bound sailing-ships, from Melbourne and Adelaide for example, have occasionally steered westward until Cape

Leeuwin was cleared, then shot up a little to the north-west into the region of easterly winds, and so getting on to the track from the East Indies. Of course the great difficulty is the liability to experience a heavy westerly gale or two before Cape Leeuwin is rounded. Steamers will naturally follow this route for several reasons; and even those from New Zealand, should they touch at Sydney, might find it pay to use the Cape of Good Hope both ways. The Aberdeen White Star steamers are constantly coming home by this route. They also keep a little to the northward after clearing the land, and then steer due west until in about 40° E. they begin to make southing towards the African land. The steaming time from Melbourne, say, to Cape Agulhas, is about twenty days. In February, 1890, the sailing-ship *Earnock* made the passage home from Port Pirie in 98 days by way of the Cape of Good Hope. She fell in with a storm in which the wind shifted from N.W. to S.W., evidently a cyclone travelling east, when in 37° S. 127° E. This lasted for 24 hours, and was her only bad weather until after the Cape land had been sighted. She crossed 30° S. in 108° E., kept along between the 27th and 28th parallels of South latitude to 50° E., crossed 30° S. in 38° E., and made the land near Agulhas. I am able to gather some idea of what she might have done by coming round Cape Horn in the usual way. A German iron ship, the *Urania*, also from Port Pirie, came up with and rapidly passed the *Earnock* in 48° N. 21° W. This vessel had beaten the *Earnock* by just eight days up to that position. She was a much faster ship altogether apparently, so that the British vessel would probably have been quite as long had she chosen the Cape Horn route. Perhaps in following the homeward route from Australia by way of the Cape of Good Hope the passage might be shortened by omitting to hug the African land so closely in too low a latitude. There is not the slightest necessity to be discouraged from attempting this route in a sailing-vessel because it happens to be known that the iron barque *Seiriol Wyn* has just put in to the Cape of Good Hope, short of provisions, 129 days out from Streaky Bay, South Australia. She is quoted above as making passages remarkable only for their extreme length, and is evidently a good monthly boat.

Passages in the Indian Ocean and Bay of Bengal still leave something to be desired, especially homeward bound from Rangoon and the rice ports. In 1890, the *Bianca* was 185 days from Rangoon to Holyhead. Twenty guineas per cent. was paid for her re-insurance. The *Boadicea* was 190 days to Falmouth, the *Bacchus* 197 days, the *Criccieth Castle* 184 days, the *Roby* and the *Ballumbie* each over 200 days, the *Clydebank* 211 days to Queenstown, and the *Berna* after 214 days at sea put in at the Cape for provisions, and got to England 90 days after sailing again! The steel barque *Nellie Troop* has just reached New York from Manilla in 209 days without putting in anywhere. This year the *Sierra Lucena* from Rangoon to England passed a German barque, in 3° S. 93° E., going the same way, 52 days out from Rangoon, having left just 20 days before the *Sierra Lucena* arrived with a full outward cargo. Having devoted some attention, and without bias, for I esteem foreign seamen the equals of our own race in many matters pertaining to the sea, though they do not surpass us in seamanship as some suppose, it behoves me to say that a rapid passage under a continental flag is almost unknown. To England and her kin across the sea in the United States belongs the renown of having accomplished the fastest passages under sail or steam.

In 1887, the wooden colonial ship *Macedon* was 217 days taking a cargo of oil from New York to Yokohama. Scurvy put in an appearance, several of the crew died, and a court of inquiry revealed a lamentable state of neglect and brutality. This scourge was rife in the good old days when long passages were common, but there must be something radically wrong on board a modern ship where it leaves her at the mercy of wind and wave to-day. In 1890 the *Rajore* was 167 days from New York to Calcutta, and 50 guineas was paid on her for re-insurance. Oil cargoes from the States, by sailing-ships bound round the Cape of Good Hope, are often a sad hindrance to making a passage. Insufficient ballast is placed on board, or it is badly stowed, and the ship is on her beam ends in the slightest puff of wind. Very fast passages, either way, in the East India trade, are very rare, by sailer. In 1871 the *Star of Persia* was 77 days from London to Calcutta. From the

Cape to her port she was only 23 days. A careful study of the Admiralty Wind and Current Charts, of the United States Pilot Charts of the North Atlantic and the North Pacific, of similar work issued by the British Meteorological Office, and the works of foreign nations, will assist in arriving at a proper appreciation of the best possible routes for sail and steam. Average winds for large areas may be good enough for mid-ocean, but near the land, just where a passage may be made or marred, there is likely to be experienced the regular land and sea breeze or local peculiarities which will be masked by grouping into large areas. I am of opinion that taken as a whole the sailing-ship does not make a faster passage now than she did thirty years ago. Maury made a big sweep, and reduced passages considerably, yet since his death matters have remained on much the same basis. Three American ships arrived at New York a few days ago from Calcutta. Here, by the way, I would add that they must have gladdened the eyes of every patriotic citizen of the United States inasmuch as their flag is almost a negligeable quantity in the ocean carrying trade. The *Benjamin Hunt* was 110 days, the *Clarence S. Bement* 149 days, and the *Sachem* 164 days. This is very poor work for 1895. I only know of one sailing-ship bound to the Indies that has used the Canal. The barque *Eleanor* on her way to the Persian Gulf, went through the Canal, and down the Red Sea. Apparently the result was not satisfactory. She was 112 days from the Lizard to Bussorah ; 11 days to Gibraltar, 30 thence to Port Said, 2 to Suez, 16 more to Straits of Bab-el-Mandeb, and 53 to her port, between July and November, 1873. Next year, June to October, she was 129 days from Beachy Head to Bussorah, by way of the Cape. Perhaps other examples of this passage may be within your knowledge ?

Certainty is denied in passage making. A master must adopt the best possible route and remain content. Where monsoons dominate, a steamer has a choice to drive against them, or deviate from the direct route. In 1881, and again in 1889, the Dutch Meteorological Department dealt with the track between Aden and Sunda Strait. The passage near Minicoy is most favourable for steamers bound east during June, July, August, and September, because then the westerly monsoon blows with strength and steadiness. Similarly for steamers bound west in December, January, and February, when the easterly monsoon prevails. The westerly monsoon is generally stiff, but does not extend to 5° S. Hence steamers may gain by seeking a more southerly route as some do. The easterly monsoon is less troublesome, and does not reach south of equator, so the deviation will not be great. Nevertheless the opposing monsoon is best avoided. March and April offer little hindrance, and the direct route is preferable. In May the westerly monsoon commences, and therefore ships bound west are at a disadvantage on the direct route because the date of commencement is ill defined. In October the doubt is the other way, while in November eastward bound steamers are likely to gain by keeping somewhat south of the direct route. In the following tables, under each tenth meridian, are given the approximate latitude for crossing. When two different latitudes are notified under the same meridian, the upper is applicable to or from Padang, the lower to or from Sunda Strait.

OUTWARD ROUTE.

Months.	55° E.	65° E.	75° E.	85° E.	95° E.
November to end of February..	11°N. to 9°N.	6°N. to 2°N.	2°N. to 2°S.	1°N. to 2°S. 1°S. to 3°S.	0° to 2°S. 2°S. to 5°S.
March......	14°N. to 10°N.	11°N. to 9°N. 7°N. to 4°N.	9°N. to 6°N. 2°N. to 0°	5°N. to 2°N. 1°S. to 3°S.	1°N. to 1°S. 3°S. to 5°S.
April to end of October	14°N. to 10°N.	11°N. to 9°N.	9°N. to 6°N.	5°N. to 2°N. 4°N. to 1°N.	1°N. to 1°S. 2°S. to 3°S.

HOMEWARD ROUTE.

Months.	55° E.	65° E.	75° E.	85° E.	95° E.
October to middle of May	14°N. to 10°N.	11°N. to 9°N.	8°N. to 6°N.	5°N. to 2°N. 4°N. to 1°N.	1°N. to 1°S. 2°S. to 3°S.
Middle of May to end of August	6°N. to 3°N.	1°S. to 4°S.	1°S. to 5°S.	1°S. to 5°S. 2°S. to 6°S.	1°S. to 3°S. 4°S. to 6°S.
September..	6°N. to 3°N.	1°S. to 4°S.	3°S. to 6°S.	1°S. to 5°S. 2°S. to 6°S.	1°S. to 3°S. 4°S. to 6°S.

And now I have detained you long enough, though it is to be hoped that no seaman is so dead to nautical enthusiasm as not to feel a thrill of pride in the fact that despite interested assertions ships under the British flag not only have the lion's share of the ocean carrying trade, but also make the quickest passages. Still there is decidedly room for improvement, more especially perhaps in the Pacific trade. Many causes conspire to prevent a rapid passage over which the shipmaster has little if any control. His ship may be tender, or deep laden for the season, short handed, badly found, or foul. A ship with a forest in miniature from water-line to keel is handicapped beyond hope of recovery, and this is undoubtedly the reason why iron ships have occasionally made such long passages of recent years. Underwriters who were acquainted with the state of such a ship's bottom stood a fair chance to win a good round sum on the gamble. Some time ago the Hamburg Hydrographic Office carried out an interesting inquiry into the duration of voyages effected by wooden, iron, and steel ships between Europe and ports in the Bay of Bengal. I am not sure whether this inquiry was official or by a member of the staff on his own responsibility. Comparison was made with ships at sea during the same seasons of the year, so as to allow full weight for the monsoons. Between Europe, Rangoon, Bassein, and Maulmein the average duration of 77 passages of iron sailers is 113 days, and that of 31 passages of wooden ships 118 days, showing a gain of 5 days for the iron vessels. From Europe to Singapore, by way of the Straits of Malacca, the average duration of 50 voyages by iron sailers is 118 days, and of the same number of wooden ships 119 days. From Rangoon and Bassein to Europe the average duration of 106 passages by iron sailers was 132 days against 127 days for 94 voyages by wooden ships. The main conclusion arrived at by the inquirer seems to be that the advantage rests with the wooden ship, since the loss on the iron ship in the homeward passage is greater than the gain in the outward passage. When comparisons are made between vessels sailing on the same day the advantage of the wooden ship as a passage-maker is more marked. Again, since the iron vessel, say, does the outward passage in 3 days less than the wooden one, we may fairly assume she ought to have the same advantage on the homeward passage. Instead of that though, she takes 5 days longer. The total loss of the iron ship on the homeward passage is, then, about 8 days.

I would only add that I alone must be held responsible for any views expressed in this paper. My principal aim has been to show that, under certain conditions, determinable in every case by the master from that knowledge of the ship and her crew which cannot be in the possession of outsiders, the passage to ports on the west coast of the Americas is much safer and quicker by steering boldly eastward from the South Atlantic and altogether avoiding Cape Horn. Even should the Horn be attempted, and westerly gales prevent advance, it will be well to run east for Bass's Strait. Coming home from South Australia by way of the Cape of Good Hope, is also another suggestion for discussion. This paper is merely, as it were, a peg on which to hang the information in your possession for the benefit of navigators under the flags of the world's Merchant Navies, and to draw out your opinions on the best routes. I trust you will discuss the route between Australia and California very fully. Captain Hepworth, of the Port Line, has dealt with the homeward route for steamers from Australia by way of the Cape of Good Hope, but he probably would have had a wider circle of competent critics had his papers been read before this, or some similar, society. A private individual cannot possibly do more than produce a tentative result, inasmuch as he has neither the time to spare nor the observations to consult, such as are at the disposal of a State-paid department.

Capt. Blackmore: Well, gentlemen, you have heard Mr. Allingham's Paper, and I do not think either you or I have any reason to think that the prophecy which I uttered before the Paper was read—that it would give us great pleasure all round—has been left unfulfilled. The Paper itself contains a large amount of information only obtainable by one who has made a study of the subject for a long time, and it has only been drawn up at an immense amount of trouble. I shall wait until the end of the discussion before I say anything further upon it, and we shall now be glad to hear any gentleman who may have anything to say upon the Paper, and Mr. Allingham will be glad, I am sure, to answer any questions which may be put to him in connection with these routes, or to give you any other information you may desire.

Capt. **Wilson-Barker** said: At no time probably did the economic conditions of trade more require ships to make good passages than at present, freights are low, steamers can be run very cheaply, but in spite of this, the building of large sailing-ships continues, and I cannot but think it will be some time yet before steamers entirely usurp the sea; and when one considers the question carefully, it is no wonder. The more one can assist in shortening passages the more likely is this condition to continue, and it is with this in view that I welcome Mr. Allingham's Paper.

I certainly think the alternative route proposed by Mr. Allingham is worth consideration, for as he has well pointed out, while the distance is longer the chance of fair winds is greater, and the wear and tear to the ship is likely to be very much less, I think that something might be done to elucidate the tracks of storms in the S. Indian Ocean.* It is very probable, and my own observations confirm this idea, that while storms follow different routes along this area in different seasons, yet the movement in latitude in these tracks seems to vary a little from season to season, but only very slightly in the season itself, so that it might be possible—after a careful consideration of the available data—to arrive at some system to forecast storm tracks from a consideration of the general states of the atmosphere about the Cape of Good Hope, Mauritius, and West Australia, where properly equipped observatories are stationed. A ship then by running into a certain latitude might easily keep in the track of the winds best suitable.

As an alternative to this, it would be interesting to know if any vessels beating round Cape Horn have tried to get round by making well to the southward; it is not at all unlikely that by doing this they might get a good slant round, and there is not much to fear from ice immediately off the Horn itself.

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* Capt. Wilson-Barker here pointed out in the chart the general weather conditions in the S. Indian Ocean.

It is to be regretted that sailors do not take more interest in meteorology, not only is its study of great importance as assisting in forecasting the weather to the individual, but also by taking careful observations and supplying them to the Meteorological Office and such centres they become available in constructing weather and current charts. And here I should like to say how much more useful the splendid maps published by the Meteorological Office would be if they were made handier in size and published at a cheaper rate.

I must close these few remarks with my thanks to Mr. Allingham for his interesting Paper, which appeals so much to sailors. It is to be hoped that the work so ably begun by the great American sailor Maury will never be allowed to drop.

Capt. BLACKMORE: I wish that more of our sailing-ship friends had been here, but unfortunately they are conspicuous by their absence.

Capt. MACKENZIE: I have no doubt that what Mr. Allingham recommends would be advantageous, *i.e.*, to take the Cape of Good Hope to San Francisco, but the 5,000 additional miles is a great drawback to a shipmaster's idea, and other ships going round the Horn might get there faster. I heard of a case where, in the wrong season, a captain went round Australia and got into Shanghai two months too late, but tea was up to £7 a ton, and he saved his bacon by getting that freight because ships were scarce; had he been early he would have been censured, and only have got £3 10s. per ton. I should certainly be inclined to run the risk round Australia to 'Frisco, and if the wind were favourable, I would go through Basses Straits.

I notice passages from Hobart to Auckland, New Zealand, with ships going through Cooks Straits, they would save about 700 miles by going round the north of New Zealand.

Capt. BLACKMORE: From where?

Capt. MACKENZIE: From Hobart.

Capt. BLACKMORE: Bound to Auckland?

Capt. MACKENZIE: If a master took his ship round North Cape bound to Auckland there would be a good many questions asked about it. Running down the easting from the Cape bound to India or China we usually did so between the parallels of 38° S. and 39° S., where we got strong westerly winds, and when in about long. 100° E. we hauled to the northward and got into fine weather in lat. 36°, or thereabout. Bound to Australia we found in lat. 40° S. to 44° S. very strong winds, with heavy seas and continuous thick weather, and the battering our ship has got in these higher latitudes has compelled us to run to the northward to about 36° lat., where we might be able to repair damages in fine weather. At the time when I was running to Australia if any man had suggested going home from Australia round the Cape of Good Hope he would have been tabooed. Yet it is now a common occurrence for the Aberdeen White Star ships to come home round the Cape.

I am inclined, therefore, to favour Mr. Allingham's opinion of taking the Cape route to San Francisco, and I dare say it only requires trying by several ships to establish it in preference to the Horn.

Capt. Blackmore: The easterly current round the Horn has a tendency to carry the bergs which are detached from the pack ice away to the east of the Horn. I know there is a good deal of terror about ice which I do not at all agree with.

The whole of the passage home by Cape of Good Hope depends entirely upon the way you can make between Melbourne and Cape Leeuwin. After that you can edge away to the north and get into the southern part of the south-east trades, and find your passage along as we used to do from India in the old days.

Capt. Froud: I confess to a feeling of disappointment at finding Mr. Allingham's Paper almost entirely devoted to sailing-ships' routes. However, his subject, as treated, provides ample material for one evening's discussion. I am sorry to see so few sailing-ship officers present. A real service is rendered by the Paper to shipping engaged in trading between the Atlantic and the ports of North-West America. Attention is directed to the eastward route, and may be it will bear fruit in helping forward research for the best routes between the South Atlantic and Australasia, and from thence to Cape Horn at the several seasons.

One object of this Paper, and the discussion upon it, is to excite the active interest of members of this Society and other navigators, and to induce them to assist the ocean meteorologists.

There are hopeful signs of those route questions being taken up seriously by them. Here are short papers on the Southern Routes by Captains Crutchley and Hepworth, the result of their individual experiences in steamers, but more data than can be collected by any private person is needed for working out the problems satisfactorily.

For routes across the southern oceans a good departure has been made by the Shaw, Savill and Albion, the New Zealand, and the Anglo-Australian Steam Navigation Companies, to which their steamers are instructed to adhere as far as wind and weather will permit.

In respect of steamers, and especially "tramps" passages, and best routes, against the monsoons, there is reason to expect authoritative suggestions in the near future. A memorandum which accompanies the daily weather chart of the Indian monsoon area, which was issued on the 1st September last by John Eliot, Esq., F.R.S., Meteorological Reporter to the Government of India, states that "Valuable suggestions have been recently made for the improvement of the Report and Chart. It has not been possible to make any alteration in its present form at the commencement of the third year of its issue, but the changes suggested will be carefully considered during the present year, and will, if possible, be embodied in the modified blank form of the Report and Chart which it is hoped the Meteorological Office will be able to prepare for next year." Dr. Doberck, of the Observatory, Hong Kong, who is engaged on the work for the China Seas, in a note referring to this Paper, dated 21st September, writes: "I am not yet prepared to write about ocean routes." Capt. H. S. Blackburne, late of the P. & O. Co., a well-known navigator, contributed some valuable remarks on "steamers passages against the monsoons in the Indian and China Seas" for use this evening had time allowed. I hope he will make some additions to them, and favour the Society with a paper on the subject at one of our spring meetings. There is much useful information to be collected for these passages, and members having experience of them will be rendering a public service if they forward any particulars to be utilized when the next paper of the kind is put before us. We have much to gain for ordinary tramp steamers by researches after Maury's methods, particularly in passages across the Indian Ocean and in the China Seas. Capt. Mackenzie has been good enough to prepare a tentative set of suggestions for use in them, and I hold in my hand notes by an officer engaged for many years in the China trade, showing how comparatively quick passages have been made, and wear and tear saved, by slow steamers carefully navigated away from the direct routes. Allow me to thank Mr. Allingham for his help so freely accorded to our Society.

Capt. BLACKMORE: I cannot sit down without joining my friend, Mr. Allingham, in what he has said about the late Capt. Maury. There is no doubt in the world that Maury, of all men, did more for the sailor than any man I know of. As a very young man, I had served in the Indian Service for a time, then on the coast at home; and then it was my lot to take command of a new steamer from the Clyde to Melbourne. Not knowing anything at all about the Colonial routes, I got all the best information I could, and amongst other things I found a set of Maury's original charts, which were in the hands of Macgregor & Co., in Glasgow, with the original book of instructions. I have got those charts still, and thought of producing them here to-night as an assistance to you all to see what our friend, Mr. Allingham, had said was founded on justice and truth with regard to Maury. From them I learned a great deal. Great circle sailing was begun to be advocated. This was in December, 1853. There had been one or two good passages before that, but it was after my voyage that the quick passages were made in 60 days out to Melbourne. This little steamer that I had was about 470 tons register, and as an experiment I kept the three-bladed screw upon her and used steam until I got down into the North-East Trades, then cut it off, and from there to Melbourne I used no more, except two or three days across the line. I had 60 tons of coal out of 200 when I got there. I left the Clyde on 4th September and sighted Tristan D'Acunha on, I think, something like the 42nd or 43rd day, and I fancied my voyage was ruined. There I thought we had not sufficient water to reach Melbourne, and I hove-to with the intention of landing but found the sea was too heavy, so determined to give it up and go on. Two days afterwards we had some very heavy showers and were able to fill up all our empty casks. From Tristan D'Acunha I took the great circle course making 52° S. In latitude about 48° S. I saw the only iceberg on the voyage. I made the great circle course round to Melbourne, and was moored in Melbourne 76 days out from the Tail of the Bank. At the same time the mails were taken out by a steamer called the *Golden Age.* She sailed from Liverpool three days after me, and got in three days before me, so I was only beaten by six days by this big powerful steamer. I must confess I have always heard men advocating not going further than 42° or 43° South, but from my own experience I should not hesitate to go down into the same latitude again ; it would not be advisable, perhaps, in long winter nights, but in the summer season I should not hesitate doing it. Capt. Barker said something about Maury's Charts being extended. This is very necessary, for our knowledge is left very much in the condition in which Maury left it.

Capt. Barker : I think it is possible to bring them up to date ; I do not think Maury's routes will be much altered, but we can bring them up to date.

Capt. Blackmore : Quite so. Mr. Allingham has noticed the building of the American ships and contrasted them with our old narrow tubs. We must not forget that long before this period the Americans had been driven into a knowledge of shipbuilding which was far superior to anything we had done. Our merchant vessels were always slow, heavy, and tender vessels, created under bad tonnage laws, but I think the Americans got their first knowledge of shipbuilding in the Baltimore clippers, which were built in the middle of the 18th century on purpose to run their smuggling business from the shores of America down to the West Indian Islands. The laws forbade the Americans trading direct with the West Indies, whether British or foreign, but they had there a good market for their produce, and they had to build a very smart class of vessels to do the smuggling down there. Thus they got into a class of shipbuilding which was quite unknown to us as a nation at that time.

Mr. Allingham has mentioned the *Sir Launcelot*—this ship I saw built. She is a very fine ship; she is an astonishing sailer and has kept up her reputation, and in beating all those ships she did it to the utter amazement of her owners. She was not built to compete with those vessels in the tea trade, but she sailed with the rest and beat them. She was built by Messrs. Robert Steel & Co., of Greenock. Then there was the *Cutty Sark*, she was one of the last vessels which were built for speed passages prior to the present type of iron ship. I think I have nothing further to say about the Paper, but I am sure we are all very much indebted to Mr. Allingham for it, and will now ask him to deal with points that have cropped up.

Mr. ALLINGHAM: As regards the passages round the Cape of Good Hope it has been actually accomplished by at least two ships in 128 and 136 days respectively, and the average outward passage to San Francisco is quite 140 days. Therefore those ships by the eastern route did not lose any time owing to the extra 5,000 miles. But the shipowner certainly looks askance at the 5,000 extra miles. He forgets the frequent delays at Cape Horn. Instead of wasting 60 days at that place the ship would be running all the time to the eastward in comfort. After being seriously damaged, and her crew frost-bitten, she may be compelled to turn round. The American ship *Louisiana*, for whose passage I am indebted to my friend, Mr. J. T. McMillan, of the San Francisco Branch Hydrographic Office, ran right back for four days from the Horn, and was then kept away to the eastward. She could have done better by keeping less to the northward after defeat. The passage to the east was first accomplished by a Liverpool ship, and this impressed upon me the probability of doing the passage much quicker by taking the easterly route direct than by attempting Cape Horn.

Capt. BLACKMORE: I must now, gentlemen, ask you to give Mr. Allingham a very hearty vote of thanks for this Paper. I am exceedingly sorry not to have had more of our members here to-night. I should have liked to have seen and heard some of our sailing masters on the point, but you know the difficulty of getting sailors together upon occasions like this. When you *do* get hold of them they enter into such questions with much interest, but despite all difficulties, we must insist on knocking our heads together so that we may be better and cleverer men than before. I propose a hearty vote of thanks to Mr. Allingham.

This was accorded with applause, Mr. **Allingham** in thanking those present for their attention and the manner in which they had received his Paper, said it was written to invite discussion especially with respect to the avoidance of Cape Horn, and passages in the Pacific to west coast ports of the Americas, now little known. The only way to effect this is to have the experience of navigators. Every master of a British ship bound for a port on the Pacific coast of the United States should co-operate with the Washington Hydrographic Office by keeping a careful record of wind, weather, barometer, and air temperature while in the Pacific, and forwarding a copy thereof to the officer in charge of the Branch Hydrographic Office at San Francisco, Cal.; Portland, Oregon; or Port Townsend, Washington, for incorporation in the monthly Pilot Chart of the North Pacific. In this way good work will be made possible in shortening passages, and after all this is what principally concerns the modern navigator.

A cordial vote of thanks to the Chairman having been proposed and seconded, for his valuable services so freely accorded to the Merchant Navy, the proceedings terminated.

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